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Marine Corps Casevac: Determining Medical Supply Needs For Long- and Short-Range Airborne Casualty Evacuation

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SUMMARY

Problem

Recent combat in Afghanistan and Iraq has seen the Marine Corps adopt a new concept in airborne casualty evacuation (CASEVAC). Historically, Marine Corps CASEVAC missions have been lifts of opportunity, in which wounded were evacuated by any available rotor-wing aircraft, regardless of whether it carried medically trained personnel. In recent years, the Marine Corps adopted a "designated" CASEVAC system in which certain aircraft are assigned casualty evacuation as one of their missions and are crewed by at least one field-qualified corpsman. However, the equipping and training of these corpsmen is currently done on an ad hoc basis, and differs from unit to unit.

Objective

In 2003, the Naval Health Research Center (NHRC) was tasked with analyzing and identifying the medical supply requirements for a long-range CASEVAC capability for the Marine Corps. This study was based on the requirements set forth in a Universal Need Statement filed with the Marine Corps Combat Development Command (MCCDC) by the 24th Marine Expeditionary Unit (Special Operations Capable). On August 3-5, 2004, MCCDC and the Marine Corps Systems Command organized an Integrated Process Team (IPT) meeting at Miramar Marine Corps Air Station to develop a statement of need (SON) for a combined short- and long-range CASEVAC capability.

Method

Thirty-one generic CASEVAC patient types were developed from the Defense Medical Standardization Board's list of patient conditions. Treatment profiles were written for each patient type and medical supplies assigned to each task in the treatment profiles, establishing the clinical requirements for the CASEVAC supply blocks. A SON for a CASEVAC capability was written, based on the NHRC findings. The NHRC CASEVAC supplies and the SON were reviewed and modified as needed by an IPT consisting of senior CASEVAC corpsmen and medical directors.

Discussion and Conclusion

The NHRC study and subsequent expert review have provided the Marine Corps with the medical supplies needed to properly augment its designated CASEVAC aircraft in Iraq and elsewhere. Once deployed with specially trained CASEVAC corpsmen, the Marine Corps will have the capability to provide wounded Marines and sailors with intermediate to advanced casualty care, depending on the skill level of the individual corpsman, for prolonged transport times of up to 4 hours.

MARINE CORPS CASEVAC:
Determining Medical Supply Needs For Long- and Short-Range Airborne Casualty Evacuation

INTRODUCTION

Recent combat in Afghanistan and Iraq has seen the Marine Corps adopt a new concept in airborne casualty evacuation (CASEVAC). Historically, Marine Corps CASEVAC missions have been lifts of opportunity, in which wounded were evacuated by any available rotor-wing aircraft, regardless of whether it carried medically trained personnel. In recent years, the Marine Corps adopted a "designated" CASEVAC system in which certain aircraft are assigned casualty evacuation as one of their missions. By being designated a CASEVAC asset, an aircraft may perform other military missions – such as delivering troops or supplies to the front line – but that aircraft will carry as part of its crew one or two Navy corpsmen trained and equipped to treat wounded Marines if the aircraft is diverted to a CASEVAC mission.[1]

In addition to these "short-range CASEVAC" missions, the Marine Corps has identified a need for a long-range CASEVAC capability. Sea Power 21 doctrine calls for projecting U.S. military power from sea-based command platforms far into any future battle space, thus maintaining reduced personnel, equipment, and logistical footprints ashore. As part of this doctrine, the U.S. Marine Corps is developing capabilities to deploy and support combat troops for short-duration, high-maneuver missions — such as tactical recovery of aircraft and personnel (TRAP) missions — deep within enemy territory and far from shore.[2] Included in this capability is the use of company-size (150 men) raiding parties from Marine Expeditionary Units (Special Operations Capable) [MEU (SOC)] for forays extending up to 400 miles from their over-the-horizon support units.[3]

Providing casualty evacuation in these combat environments presents special problems. Even troops patrolling at relatively short distances from forward operating bases may have difficulties evacuating casualties by ground to a surgical facility. Small mobile units operating at large distances from rear areas or sea-based platforms, such as TRAP missions, will not have the support of even an intermediate treatment facility such as a battalion aid station. At such distances, even evacuation by available air assets — such as the CH-53 Sea Stallion and the CH-46 Sea Knight and their variants — would be well outside the "golden hour" by which time trauma experts agree severely injured patients must receive some form of advanced lifesaving intervention.[3, 4]

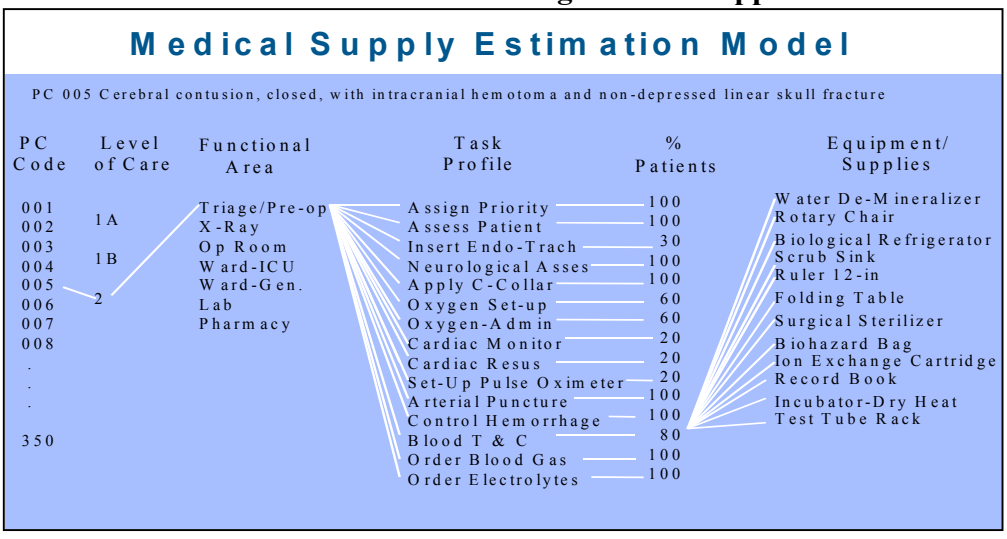
The multi-service Committee on Tactical Combat Casualty Care determined that highly mobile battle tactics require a means of providing intermediate to advanced casualty care during CASEVAC missions, especially when transportation is prolonged or has been delayed.[5] However, there is currently no official such asset in the Marine Corps warfighting inventory.

As a result, Marine Corps units have developed ad hoc means of providing CASEVAC in Afghanistan and Iraq. The 24th MEU (SOC), for example, designated a CH-53 Sea Stallion as a long-range CASEVAC platform to provide advanced trauma life support for up to 16 wounded Marines.[3, 4] During Operation Iraqi Freedom I and II, air elements of the 1st Marine Expeditionary Force developed a CASEVAC system utilizing available medical personnel, and the equipment and supplies designed for postsurgical en route care.[1] Neither system of casualty evacuation can be supported with existing materiel and personnel resources.[3]

In 2003, the Naval Health Research Center (NHRC) was tasked with analyzing and identifying the medical supply requirements for a long-range CASEVAC capability for the Marine Corps. This study was based on the requirements set forth in a Universal Needs Statement filed with the Marine Corps Combat Development Command (MCCDC) by the 24th MEU (SOC).[6] On August 3-5, 2004, MCCDC and the Marine Corps Systems Command organized an Integrated Process Team (IPT) meeting at Miramar Marine Corps Air Station to develop a statement of need (SON) for a combined short- and long-range CASEVAC capability. The IPT consisted of 16 subject matter experts (SMEs) representing senior CASEVAC corpsmen, physicians with CASEVAC medical direction experience, and medical logistics experts (see Appendix A). With so many combat-experienced medical experts available, a decision was made to use some of the IPT schedule as an SME panel for vetting NHRC's proposed medical equipment and consumable list for CASEVAC missions.

Figure 1

NHRC Method of Modeling Medical Supplies



METHOD

The 2003 NHRC study utilized the Center's method of modeling medical supply requirements, which was developed to establish and/or review Authorized Medical Allowance Lists (AMALs) for various levels of care in the Navy and the Marine Corps. Its aim is to give clinicians in the field or the fleet the materiel they need to provide the best care possible, while still maintaining as small a logistical footprint as possible in concert with current Navy and Marine Corps doctrine.

It involves a four-step process that begins with the identification of likely patient types to be encountered by a particular type of medical treatment asset, including combat wounds, nonbattle injuries, and illnesses. Patient conditions (PCs) found in the Defense Medical Standardization Board (DMSB) treatment briefs are used for this purpose. The PCs are then linked to clinical tasks developed by DMSB and NHRC. Those tasks are, in turn, linked to each supply item needed to complete the task. Equipment and consumable supplies can then be calculated based on the probability of those PCs occurring in a patient stream. Figure 1 provides a basic representation of the NHRC modeling process.

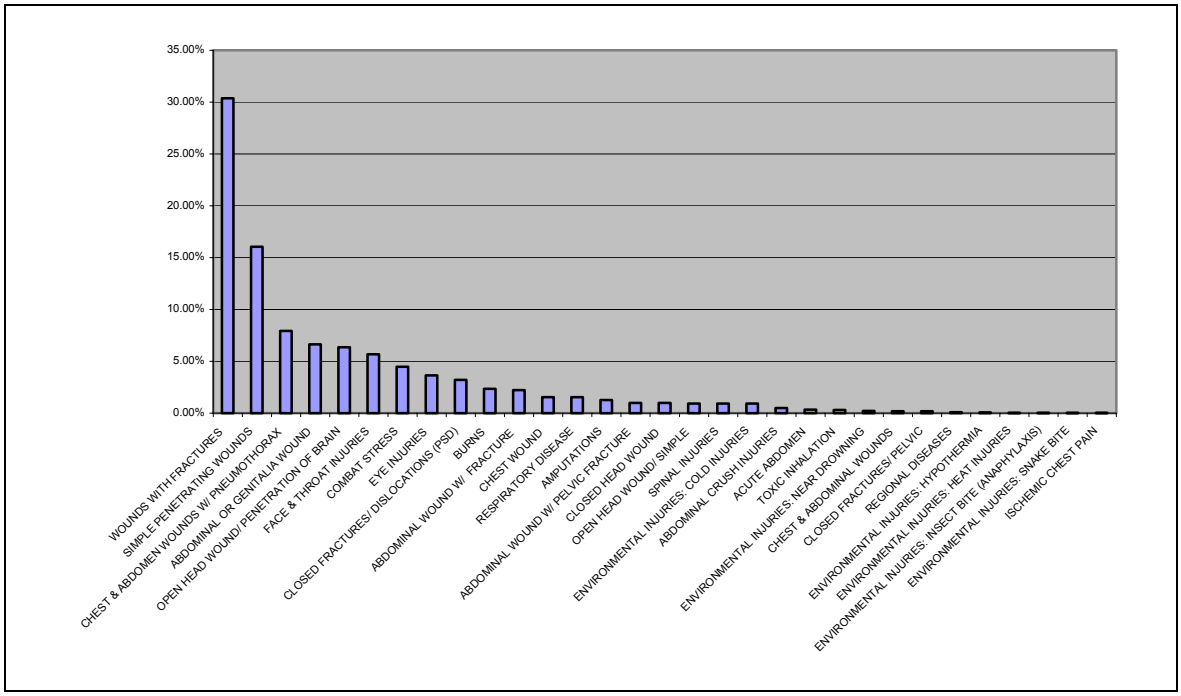
One hundred and ninety-nine PCs were identified as those most likely to be encountered by a CASEVAC medical crew. For modeling purposes, these DMSB PCs were distributed into 31 generic patient types divided into three categories – trauma, environmental injury, and illness. The underlying probability of the selected DMSB PCs occurring in a given battle was determined by running a patient stream containing the PCs through the NHRC Estimating Supplies Program, using a combined East-West battle scenario incorporating a Northeast Asia Heavy Battle Intensity and Southwest Asia Heavy Battle Intensity. This scenario was chosen to provide a robust patient stream for modeling.

Once the probability of the individual PCs was determined, the underlying probability for each of the generic CASEVAC patient types was calculated. Figure 2 shows the 31 generic patient types and their probability of occurrence in a major East–West confrontation.[6]

Task profiles were created for each generic patient type. Task profiles include the unique clinical interventions required by each patient type, and establish a systematic sequence of clinical tasks to be performed by the attending corpsmen. Forty-nine clinical tasks were identified. These clinical tasks were compared with the 12 major categories of clinical skills recommended for CASEVAC care by the Committee on Tactical Combat Casualty Care and found to encompass all skill categories. A list of these clinical tasks can be found in Appendix B. Once completed, a patient stream of 16 patients was run against the supply set to yield the final quantities for each supply item.[6]

Figure 2

Probability of Occurrence of CASEVAC Patient Types



RESULTS

The original NHRC study developed a proposed AMAL for a long-range CASEVAC mission involving a single helicopter carrying up to 16 patients, 2 of them critically wounded and requiring ventilator support. This was based on the requirements set out by the 24th MEU (SOC) based on its combat experience in Afghanistan.[6]

Since then, combat operations in Iraq have developed new requirements for shorter range missions. A decision was made among the IPT SMEs to develop a CASEVAC AMAL capable of providing short-range care to 8 casualties, including 1 critically wounded, 5 litter casualties and 2 ambulatory or "walking wounded." Combining 2 of these AMALs, plus a small, long-range supplement, would provide a long-range evacuation capability for up to 16 injured Marines, including 2 critically wounded, 10 litter patients, and 4 ambulatory patients. Since current CASEVAC doctrine calls for 2 aircraft to fly in tandem at all times, these patients would most likely be split between 2 helicopters.[7]

The SON developed at the IPT meeting specifically set forth the level of care required for the CASEVAC mission. It lists as a Key Performance Parameter that the CASEVAC AMAL shall provide for long-range missions the "equipment and supplies for care of casualties who may require ventilator support, physiological monitoring, intravenous therapy, medication administration, supplemental oxygen therapy, airway maintenance,

head and limb immobilization, hemorrhage control, management of infectious human & medical waste, and burn management material."[7]

Personnel for long-range missions would be limited to search-and-rescue hospital corpsmen [Navy Enlistment Classification Code (NEC): 8401/8404], who already possess many of the advanced clinical skills required by the mission, as well as aircrew qualifications. For short-range CASEVAC missions, the SON specifies the use of medical specialist hospital corpsmen assigned to the Marine Corps (NEC 8401/8404, 8404, 8406, and 8409), some of whom may or may not have aircrew qualifications. Corpsmen for both missions will require additional training, though the extent of the training for both short- and long-range missions will depend on the individual corpsman's existing level of training. Additional skills needed may include rapid sequence intubation, needle decompression of the chest, ventilatory support and more advanced pain control.[7]

Once the level of care and corpsmen skill levels were established, the SMEs turned to solidifying the AMAL. The AMAL developed for long-range CASEVAC missions by NHRC included several medications not normally used by corpsmen, but which were identified as necessary by the Committee on Tactical Combat Casualty Care.[5, 6] Additional medications were added by the SMEs – physicians and corpsmen alike – as deemed necessary for the successful completion of the CASEVAC mission. *Use of these medications will depend on the training and skill level of the individual corpsman and his or her medical direction.* Table 1 lists these medications and their proposed use.

Table 1

Special Medications for CASEVAC Use

Medication	Use	Long or Short Range Mission
Morphine	Pain control (major wounds)	Both
Promethazine*	Antiemetic	Both
Ketorolac	Pain control (moderate/minor wounds)	Both
Naloxone	Reverse narcotic respiratory depression	Both
Cefotetan*	Infection control	Long range
Gatifloxacin*	Infection control	Long range
Diazepam	Sedate agitated patients	Both
Dexamethasone	Head injuries	Long range
Diphenhydramine	Respiratory distress	Long range
Epinephrine	Respiratory distress	Long range
Midazolam	Rapid sequence intubation	Both
Succinylcholine	Rapid sequence intubation	Both
Vecuronium Bromide	Rapid sequence intubation	Both
Ketamine	Rapid sequence intubation	Both

*Recommended by the Committee on Tactical Combat Casualty Care.

Table 2 shows the final weight, cube, and cost distribution of the proposed CASEVAC AMAL, including the supplement supplies needed for long-range missions. The full list of CASEVAC medical equipment and consumables can be seen in Appendix C.

Table 2

CASEVAC Weight, Cube, and Cost

Equipment	
Weight	97.3
Cube	8.8286
Cost	$5,027.67
Consumables	
Weight	70.18
Cube	9.64
Cost	$4,568.98
Long-range supplement	
Weight	48.28
Cube	5.72
Cost	$25,028.31
Combined Totals	
Weight	215.76
Cube	24.1886
Cost	$34,624.96

DISCUSSION AND COMMENT

The NHRC study and subsequent IPT and SME panels will provide the Marine Corps with the medical supplies needed to properly augment its designated CASEVAC aircraft in Iraq and elsewhere. Once deployed with specially trained CASEVAC corpsmen, the Marine Corps will have the capability to provide wounded Marines and sailors with intermediate to advanced casualty care, depending on the skill level of the individual corpsman, for prolonged transport times of up to 4 hours.

The combined input of researchers and experienced CASEVAC personnel also identified areas of additional training needed for corpsmen involved in airborne CASEVAC. Establishing an official SON and CASEVAC AMAL will lead to standardization not only of equipment and supplies throughout the Corps, but also of training and skill sets for CASEVAC corpsmen.

However, establishing the CASEVAC AMAL is not an end in of itself. The AMAL should be regularly reviewed and updated as experience on the battlefield reveals either success or failure of the AMALs component, or as new technology applicable to CASEVAC becomes available. This study and subsequent panels have proved NHRC's

method of researching and modeling is appropriate for conducting such ongoing reviews and updates.

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4. Semple GJ, LCdr. Request for Approval of Proposed Equipment, Medicine and Consumable Supply Lists for 22d MEU Combat Casualty Transport Teams. In: Surgeon IM, ed; 2002.

5. Tactical Combat Casualty Care: Prehospital Care in the Tactical Environment: The Committee on Tactical Combat Casualty Care; 2003 (Draft):52.

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Appendix A:
CASEVAC Integrated Process Team Attendees

CASEVAC Integrated Process Team Attendees

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Appendix B:
Identified Clinical Tasks for CASEVAC

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Identified Clinical Tasks for CASEVAC

Task	Task Description
002	Assessment and Evaluation of Patient Status
006	Establish Adequate Airway (Oro/Naso Pharyngeal only)
007	Emergency Cricothyroidotomy
010	Neurological Assessment
011	Stabilize Neck (Collar/Spine Board)
018	Recognize and Respond to Hemorrhage
022	O2 Administration Setup
023	O2 Administration Continuous (Nasal/Mask)
024	Vital Signs
032	Set-Up Pulse Oximeter
038	Maintain on Ventilator
049	Start/Change IV Infusion Site
050	Administer IV Fluid
070	Bowel Sounds Assessment
071	Insert NG/OG Tube
073	Perform NG/OG Suction
075	Irrigate NG Tube
079	Catheterization, Foley
082	Measure/Record Intake/Output
086	Clean and Dress Wound
088	Reinforce Dressings
091	Apply Ice/Hot Packs
096	Apply Sling
098	Apply Splint/Immobilize Injury
108	Minor Surgical Procedure (Debride/Suture/Incision)
123	Eye Care (Dressings/Eye Patch)
126	Seizure Care/Precautions
142	Document Appropriate Meds/Treatment
145	Administer Appropriate Medication
A6	Apply Tourniquet
Z014	Endo/Naso-tracheal Intubation
Z027	Cardio Arrest Resuscitation
Z030	Electronic Monitoring of Patient Vital Signs (Propaq)
Z037	Bag Valve Mask Setup
Z039	Perform Ventilation with Bag Valve Mask
Z083	Expose Patient for Exam
Z094	Extremity Traction, Application/Adjust
ZZ03	Needle Thoracostomy

Appendix B:
Identified Clinical Tasks for CASEVAC

Task	Task Description
ZZ19	Warm Infusion Fluids
ZZ42	Patient Warming
ZZ58	Rapid Pressure IV Infusion
ZZ65	Conduct Patient Hand-Off
ZZ67	Secure Patient to Litter/Airframe
ZZ77	Assess Airway/Breathing
ZZ80	Perform Suction (E-T Tube/Tracheostomy Tube)
ZZ85	Reassess Tourniquet
ZZ93	Manage Seizing Patient
ZZ96	Assemble/Replenish/Resupply Materiel
ZZ98	Preventive Maintenance, Checks, & Services of Equipment

Appendix C:
CASEVAC Medical Equipment and Consumables

	NOMEN	QTY	UI	TOT W	TOT C	TOT PRICE
NSN	**EQUIPMENT**					
PN: LBTC-2209	Bag Aeromedical Large (Note: London Bridge)	1.00	EA	1	0.1	$241.43
PN: LBTC-2210A	Bag Aeromedical Small (Note: London Bridge)	1.00	EA	1	0.1	$235.71
PN: 3802-000	Case Protective For Nonin Pulse Ox (Note: Nonin Medical)	2.00	EA	0.5	0.05	$50.00
6515012808163	Infusor Pressure Blood/Iv 14x6in 1000ml	2.00	EA	0.7	0.09	$24.38
6515013448487	Injector Tube Reusable 1ml & 2ml Ndl Units	2.00	EA	0.22	0.13	$8.62
PN: 563-8025	Knee Pads Tactical Black 1pr (Note: Blackhawk Industries)	2.00	PR	1	0.1	$28.54
6515014553888	Lantern Electric Head Mount Halo/Krypton	2.00	EA	1.1	0.24	$46.00
6515006165052	Laryngoscope Macintosh Child/Adult 4 Blade	2.00	EA	7.92	0.32	$111.00
6540014553885	Lens Cover Red Lantern Electric Head Mount	2.00	EA	1.1	0.24	$4.00
6530015049051	Litter Decontamination Black Folding	4.00	EA	44	4.4	$1,400.00
6515012530306	Mask Pocket Oronasal For CPR	2.00	EA	0.2	0.02	$32.34
6515014586178	Otoscope & Ophthalmoscope Set Deluxe Soft	2.00	EA	11.1	0.224	$560.00
6515014660971	Oximeter Pulse Finger Battery Op Nonin	2.00	EA	1.1	0.1	$700.00
PN: 60MP01OD	Bag Medical Stomp2 Olive Drab (Note Blackhawk Industries)	2.00	EA	14	2	$599.90
6515012045394	Resuscitator Hand Operated High O2	2.00	EA	2.4	0.03	$303.00
6515009357138	Scissors Bandage 7.25in Angle To Hdl	2.00	EA	0.38	0.028	$4.00
PN: HEM-630	Sphygmomanometer Auto Digital Wrist (Note: Omron Corp.)	2.00	EA	1	0.1	$140.00
PN: 540712	Sphygmomanometer Manual One-Hand Illuminated Dial (Note:Boundtree Medical))	2.00	EA	1	0.1	$59.90
6515013146694	Stethoscope Littman Classic Ii 28in Lg	2.00	EA	2	0.006	$98.82
PN: 203-L	Strap Chem Lite (Note: Lifesaving Systems)	2.00	EA	1.6	0.16	$20.60
PN: 276-000-001	Suction Ambu Res-Cue Hand Pump (Note: Ambu Corp)	1.00	EA	0.25	0.025	$54.95
6545009577650	Surgical Instrument Set Minor Surgery	2.00	SE	3.73	0.2656	$304.48
				TOT WEIGHT	**97.3**	
				TOT CUBE	**8.8286**	
				TOT COST	**$5,027.67**	

NSN	NOMEN	QTY	UI	TOT W	TOT C	TOT PRICE
	MEDICATIONS					
6505011277946	Bupivacaine Hcl Inj .50% 30ml Vial 10s	0.20	PG	1.688	0.01	$2.75
6505012426532	Cefotetan Disodium Sterile 2gm Vial 10s	0.50	PG	4.625	0.1825	$896.07
6505015053476	Diazepam Inj 5mg/Ml 2 Ml Cartridge Unit 10s	0.02	PG	0.011	0.0024	$0.47
6505001487177	Diphenhydramine Hcl Inj 50mg/Ml 1ml Syr 10s	0.02	BX	0.005	0.00066	$0.22
6505007341026	Epinephrine Inj USP 1mg/Ml 1ml Ampul 10s	0.02	PG	0.005	0.00024	$0.09
6505015034855	Gatifloxacin 400mg Tab Blister Pack 100s	0.10	PG	0.055	0.012	$64.20
6505012811247	Hespan In Sodium Chloride Inj 500ml Bag 12s	0.17	PG	2.72	0.085	$50.17
6505013391909	Ketamine Inj 10ml Vial 10s	0.50	PG	0.025	0.001	$21.27
6505013874095	Ketorolac Tromethamine Injection USP 30mg/Ml 1ml Unit 10/Package	0.20	PG	0.27	0.003	$11.92
6505005843131	Lidocaine Hydrochloride Jelly USP 2% 30ml	1.00	PG	0.15	0.006	$7.60
6505012444736	Midazolam Hcl Inj 5mg/Ml 1ml Vial 10s	0.50	PG	0.09	0.004	$31.51
6505015055813	Morphine Sulfate Inj 10mg 1ml Cart-Ndl 10s	0.50	PG	0.575	0.075	$6.21
6505000797867	Naloxone Hcl Inj USP .4mg/Ml 1ml Amp 10s	0.50	BX	0.06	0.025	$2.43
6505013876735	Promethazine Hydrochloride Injection USP 25mg/Ml 1ml Unit 10/Pg	0.50	PG	0.575	0.006	$4.66
6505014622436	Sodium Chloride Injection 0.9% 1000ml Bag 12s	0.17	PG	1.4348	0.0204	$1.43
6505014716410	Succinylcholine Chloride 100mg/Ml 10ml Vial 25s	0.08	PG	0.1	0.028	$5.55
6505012580983	Vecuronium Bromide Inj 10mg/Ml 10ml Vial 10s	0.20	PG	0.09	0.006	$28.55
	CONSUMABLES					
6510002035000	Adhesive Tape Surgical 3in X 5yd	2.00	SL	0.7	0.026	$5.60
6515013215211	Airway Kit Percutaneous Emergency Adult 1s	1.00	EA	0.2	0.05	$186.68
6515011676637	Airway Nasopharyngeal Robertazzi 30fr 12s	0.50	PG	1.5	0.1	$29.62
6515009582232	Airway Pharyngeal Berman Design 80mm 12s	0.17	PG	0.0442	0.00442	$0.54
PN: 000 172 002	Ambu Tubechek-B (Bulb Version) 20s	0.25	PG	0	0	$21.25
6510015032109	Bandage Elastic 8x10" Compressed Sterile (Cinch Tight)	16.00	EA	8.96	1.92	$63.52
6510009355823	Bandage Elastic Rolled Ace 6inx4.5yds 12s	0.83	PG	2.6975	0.23572	$17.55
6510000583047	Bandage Gauze Kerlix 4.5in X 4yds 100s	0.16	PG	0.184	0.00416	$15.77
6510002011755	Bandage Muslin Camouflage 37x37x52in 1s	16.00	EA	2.08	0.128	$32.80
6135009857845	Battery Nonrechargable 1.5v AA 24s	0.50	PG	0.05	0.0005	$3.76
6135008264798	Battery Nonrechargable 1.5v AAA 24s	0.50	PG	0.1	0.001	$1.63
7210009356665	Blanket Casualty 84x56in Plast Solid Tapd	4.00	EA	3.08	0.28	$23.84
PN: 276-000-010	Canister Suction W/ Catheters Ambu Res-Cue 10s	0.20	PG	0.02	0.002	$19.80
6515013909627	Catheter & Needle Unit IV 14gax1.25in 200s	0.05	PG	0.285	0.0016	$23.55
6515013909654	Catheter & Needle Unit IV 18gax1.25in 200s	0.04	PG	0.9	0.00572	$15.75
6515013909650	Catheter & Needle Unit IV 20gax1.25in 200s	0.05	PG	1.155	0.00715	$24.65
6515011069054	Connector Tubing Iv Inj Set J-Loop Flex Ext Tube Plas Ster 200s	0.01	PG	0.02	0.002	$2.14
6530014686154	Container Disposal Sharps Shuttle 24s	0.04	PG	0.12	0.01	$2.04
6510014575844	Dressing Burn 8x18in W/Water-Gel 20s	0.20	PG	0.11	0.024	$20.60
6510014081920	Dressing Chest Wound Seal Asherman 10s	0.80	PG	1.24	0.0096	$80.57
6510002017425	Dressing First Aid Field Camo 11x12in	4.00	EA	2	0.152	$20.80
6515011602537	Electrode Electrocardiograph 30s	0.20	PG	0.1	0.018	$3.33
6515015217505	Glove, Patient Examining & Treatment Sz Lg Olive Drab 50s (Note: Boundtree Medical)	0.50	PG	0.1	0.1	$4.13
6515015217501	Glove,Patient Examining Sz Med Olive Drab 50s (Note: Boundtree Medical)	0.50	PG	0.1	0.1	$4.13
6510014999285	Hemostatic Pack Wound 5x7in Pkg Quick Clot 1s	4.00	EA	0.32	0.24	$39.40
6515014697217	Holder Tube Endo Tracheal Thomas Sti 1s	6.00	EA	3.3	0.72	$2,040.00
6515014530960	Infusion Set Fluid Intraosseous F.A.S.T. 1s	1.00	EA	0.2	0.02	$95.00

NSN	NOMEN	QTY	UI	TOT W	TOT C	TOT PRICE
6515011050614	IV Inj Set Macrodrip 15 Drops/Ml 50s	0.12	PG	0.015348	0.003348	$9.64
PN: 351202	IV Start Kit Latex Free 1s (Note: Boundtree Medical)	10.00	EA	0.1	0.1	$18.00
8405008893683	Liner Poncho (Tri-Service Approved Blanket)	4.00	EA	2	0.06	$129.80
6505001117829	Lubricant Surgical 5 Gram 144s	0.07	PG	0.1442	0.00455	$0.50
7520013964722	Marker Tube Type Black Permanent Ultra Fine Point Sharpie 12s	0.33	PG	0.132	0.00033	$4.71
6515013419329	Mask Face Cardiopulmonary Resuscitation Clear Plas Nonster Disp	2.00	EA	0.02	0.002	$10.52
6515008886122	Mask Oronasal Semi-Rigid Translucent 50s	0.04	PG	0.22	0.06	$1.67
6515011727650	Needle Hypo Gp 22ga 1.5in Lg Luer Lock 100s	0.10	PG	0.048	0.05	$0.44
6510007863736	Pad Prep Isopropyl Alcohol Impreg 1x2.5in 100	0.50	PG	0.25	0.05	$1.29
PN: 9100-1012	Pads Defibrillator Multifunction 1pr (Note: Access Cardiosystems)	1.00	PR	0.2	0.02	$66.00
7520009357136	Pen Ball-Point Retractable Med Pt Black	0.17	DZ	0.0612	0.02448	$0.86
8520013535671	Skin Cleanser 60pct Alcohol No Rinsing	0.08	PG	0.72	0.04	$3.07
6515015096866	Sling, Pelvic Fracture Stabilizer 1s	1.00	EA	0.12	0.08	$50.00
6515012254681	Splint Malleable Alum 36x4.5in 12s	0.30	PG	1.5	0.144	$10.23
6510001161285	Sponge Surgical 12-Ply 4x8in White 80s	0.75	PG	18.75	3.75	$128.87
6515013948327	Stylet Tracheal Tube 7.5-10mm Plas Disp 10s	0.40	PG	0.84	0.0084	$16.36
6515014663004	Support Cervical Plas Univ Olive Drab (P/N: 000 281 000mil)	0.07	PG	0.0455	0.00105	$25.45
6515014520465	Syringe & Needle Vanish-Point 3cc 23ga 100s	0.10	PG	0.06	0.07	$8.24
6515007540412	Syringe Hypo Gp 10ml Cap Luer Slip 100s	0.10	PG	0.58	0.057	$1.90
6515014570288	Syringe Irrigating 60ml Luer Plas Disp 120s	0.03	PG	0.0375	0.0075	$3.03
PN: 732219	Tag Incident Military Mass Casualty Kit (Note: Boundtree Medical)	1.00	PG	0.25	0.2	$35.00
5640014620102	Tape Duct 2in X 60 Yards Black Industrial Grade	1.00	RO	0.55	0.12	$7.45
6515015002974	Tourniquet Self Applied Tourniquet System 1s	2.00	EA	0.62	0.062	$25.90
6515010369034	Tube Endotracheal Murphy 7.5mm 10s	0.20	PG	0.24	0.052	$4.59
6515001050759	Tube Endotracheal Murphy 8.0mm OD 10s	0.20	PG	0.2	0.01	$4.12
6515001490316	Tube Stomach Surgical Plastic Salem 50s	0.04	PG	0.16	0.028	$7.37
6515014211388	Tube Tracheal Esophageal Combitube 41 Fr 4s	0.25	PG	0.25	0.005	$51.07
6515013625805	Valve Oronasal Mask One-Way Valve Used w/Laerdal Pocket Mask 10s	0.20	PG	0.02	0.0002	$9.37
				TOT WEIGHT	**70.18**	
				TOT CUBE	**9.64**	
				TOT COST	**$4,568.98**	

LONG-RANGE CASEVAC SUPPLEMENT						
NSN	NOMEN	QTY	UI	TOT W	TOT C	TOT PRICE
	MEDICATIONS					
6505009635355	Dexamethasone Sod Phos Inj 4mg/Ml 5cc	2.00	VI	0.16	0.006	$0.92
PN: 02-08-70	Oxygen 3000psi Ballistic Safe Carbon Fiber D Tank (Note: Boundtree Medical)	4.00	EA	14.8	1.2	$1,900.00
	Subtotals			14.96	1.206	$1,900.92
	CONSUMABLES					
PN: 9100-2020	Battery AED Replacement 1s (Note: Access Cardiosystems)	1.00	EA	0.5	0.05	$90.00
6515001490104	Catheterization Kit Urethral 16fr Disp	2.00	EA	1.42	0.508	$12.96
PN: CPR-24	Circuit Vent Extension W/ Filter & Swivel (Oxylator) 25s (Note: Lifesaving Systems)	0.16	PG	0.04	0.0032	$14.40
6515014773259	Filter Viral/Bacterial Single Use (Oxylator) 50s (Note: Lifesaving Systems)	0.08	PG	0.1	0.02	$2.80
	Subtotals			1.56	0.5312	$30.16
	EQUIPMENT					
PN: 9100-5001B	Defibrillator Automatic W/Override (Note: Access-ALS Fr Access Cardiosystems)	1.00	EA	2.8	0.28	$1,689.00
6515014322711	Monitor Patient Vital Signs Propaq 206el	1.00	EA	25	2.4	21277.8
PN: D2301	Regulator Oxygen Gas 1 Port Tactical (Note: Boundtree Medical)	2.00	EA	3	1	152
6515014652119	Resuscitation And Inhalation System Oxylator Em-100	2.00	EA	2.5	0.5	1550
6515013737292	Thermometer Clinical Human Oral Digital	1.00	EA	0.01	0.001	9.5
6515013469186	Traction Apparatus Kendrick F/Immobilization	1.00	EA	1.25	0.08	107.93
	Subtotals			31.76	3.981	$23,097.23
				TOT WEIGHT	**48.28**	
				TOT CUBE	**5.72**	
				TOT COST	**$25,028.31**	

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14. ABSTRACT (maximum 200 words)

Historically, Marine Corps casualty evacuation (CASEVAC) missions have been lifts of opportunity, in which wounded were evacuated by any available rotor-wing aircraft, regardless of whether it carried medically trained personnel. In recent years, the Marine Corps adopted a “designated” CASEVAC system in which certain aircraft are assigned casualty evacuation as one of their missions and are crewed by at least one field-qualified corpsman. However, the equipping and training of these corpsmen is currently done on an ad hoc basis, and differs from unit to unit.

In 2003, the Naval Health Research Center (NHRC) was tasked with analyzing and identifying the medical supply requirements for a long-range CASEVAC capability for the Marine Corps. Thirty-one generic CASEVAC patient types were developed from the Defense Medical Standardization Board’s list of patient conditions. Treatment profiles were written for each patient type and medical supplies were assigned to each task in the treatment profiles, establishing the clinical requirements for the CASEVAC supply blocks. A statement of need (SON) for a CASEVAC capability was written, based on the NHRC findings. The NHRC CASEVAC supplies and the SON were reviewed and modified as needed by an Integrated Product Team consisting of senior CASEVAC corpsmen and medical directors.

The NHRC study and subsequent expert review have provided the Marine Corps with the medical supplies needed to properly augment its designated CASEVAC aircraft in Iraq and elsewhere.

15. SUBJECT TERMS
medical supplies, AMAL, Surgical Company, operational medicine, Marine Corps

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